Land Quality

Photo by Richard Fields, Indiana Department of Natural Resources.

Till, filled with other thought, I turn again
To where the pathway enters in a realm
Of lordly woodland, under sovereign reign
Of towering oak and elm.

A puritanic quiet here reviles
The almost whispered warble from the hedge,
And takes a locust's rasping voice and files
The silence to an edge.

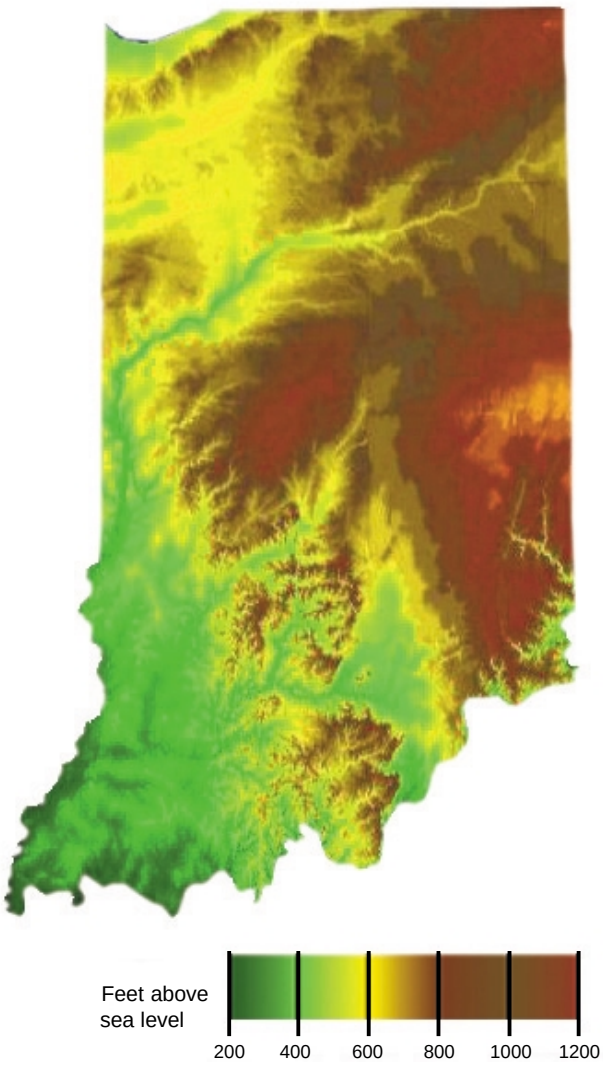
In such a solitude my somber way
Strays like a misanthrope within a gloom
Of his own shadows—till the perfect day
Bursts into sudden bloom,

And crowns a long, declining stretch of space,
Where King Corn's armies lie with flags unfurled,
And where the valley's dint in Nature's face
Dimples a smiling world.

"A Country Pathway"

James Whitcomb Riley (1849-1916)

Indiana topography



Source: Indiana Geological Survey, 1988

INDIANA TERRAIN

Indiana covers an area of 36,300 square miles, of which 99 percent is land. Indiana's topography ranges from 324 to 1,257 feet above sea level. The lowest point of elevation is in the southwest corner of Indiana where the Wabash River flows into the Ohio River. The highest point is in Wayne County in east central Indiana in an open field marked by a small pile of stones.

Past waste management practices have caused many significant problems that the state must continue to address, including contaminated sites, leaking underground storage tanks, spills, landfills and open dumps that can contaminate ground water.

Thousands of contaminated Indiana properties require cleanup. Many are actively under investigation or cleanup. Others are yet to be discovered.

Once identified, contaminated sites are assessed for their potential threats to human health and the environment, which determines the approach taken to clean them up.

Restoring natural resources

Injury to natural resources (surface water, ground water, wetlands, sediment, land, fish, wildlife, air, etc.) at contaminated sites and surrounding areas are assessed by state and federal designated Natural Resource Trustees. If injury is determined, trustees then seek compensation from the responsible party or parties to replace the injured resources. In 1999, more than 300 acres of land were restored or acquired by the Natural Resource Trustees to replace injured resources in Indiana. Since 1997, more than 1,000 acres of land have been restored or acquired.

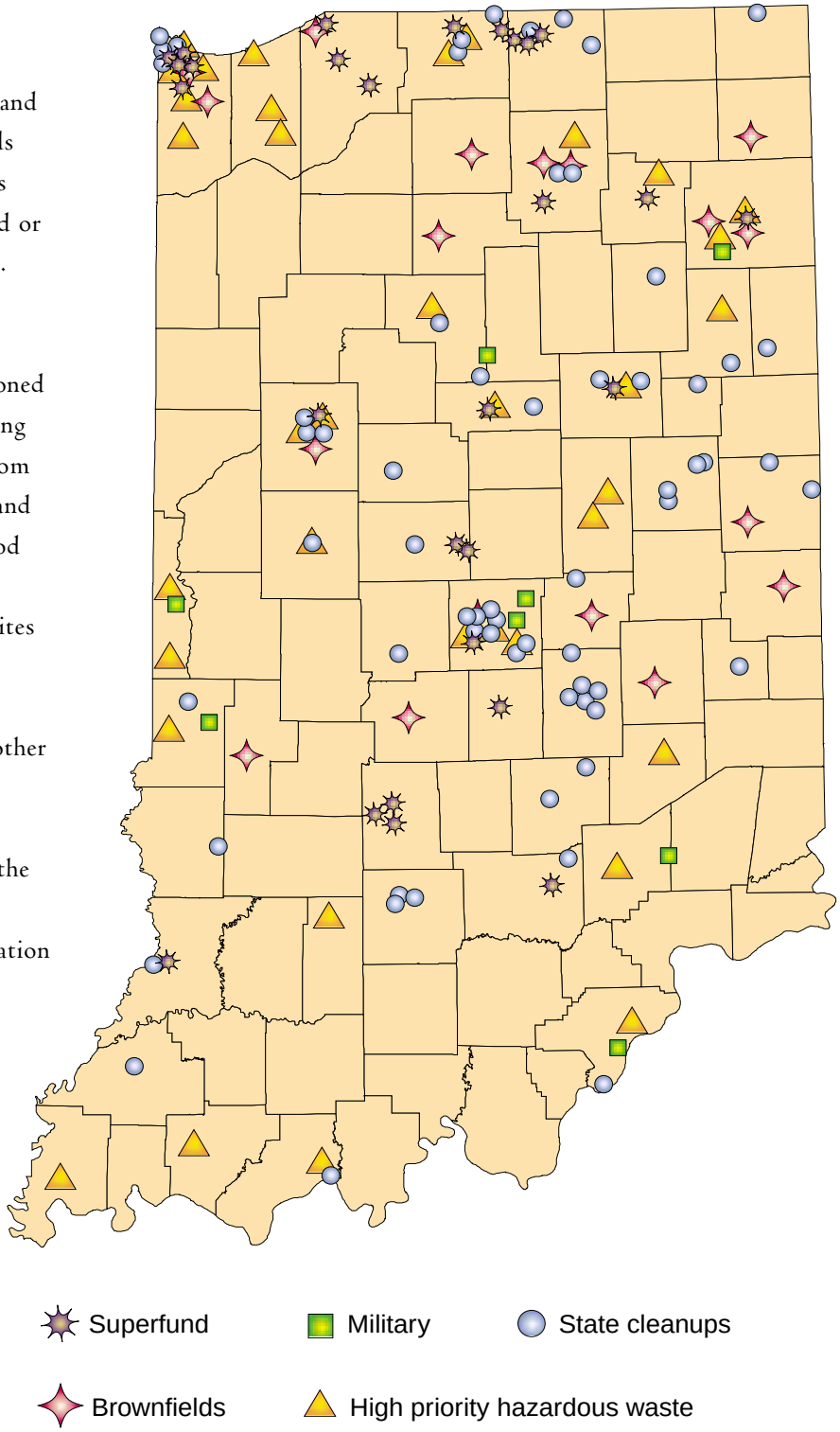
CONTAMINATED SITES

Prior to the 1970s, waste disposal was largely uncontrolled. Some industries dumped hazardous wastes onto the land and left drums filled with hazardous materials outside to leak and corrode. Garbage was taken to town dumps where it was burned or buried without environmental safeguards. The result was contaminated sites.

In Indiana, there are thousands of abandoned and operating hazardous waste sites posing significant threats to the environment from contaminants leaking into the land, air, and water. Indiana sites include landfills, wood treating facilities, foundries, mining or manufacturing sites, and others. These sites are contaminated with heavy metals, chemicals, pesticides, cleaning solvents, sludges, acids, asbestos, petroleum, and other waste materials.

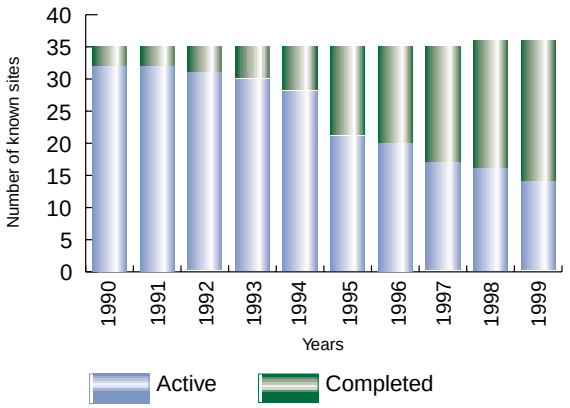
Once a contaminated site is discovered, the type of property, ownership, source, and potential nature and extent of contamination will determine how the site is managed. Descriptions of the general cleanup categories appear on the following pages.

Priority contaminated sites



Source: IDEM Office of Land Quality, 1999

Superfund cleanups



Active sites are defined as sites where initial investigation, cleanup design or actual cleanup is occurring.

Completed sites are sites that have been cleaned up and are being monitored.

Source: IDEM Office of Land Quality, 1999

Superfund cleanups

Sites that are highly contaminated, or pose an immediate threat, may be proposed for inclusion on EPA's National Priority List (NPL), better known as Superfund. The federal Superfund targets complex, heavily contaminated sites for cleanup, focusing on those sites that pose the greatest health threats.

Superfund sites commonly contain soils contaminated by improperly stored or disposed chemicals. Wetlands, ground water, lakes and rivers may be contaminated through soil contact or storm water runoff. As of 1999, of the 36 Superfund sites in Indiana, cleanup efforts are underway at 14 of the sites. At 22 sites, cleanup responses are complete and are being monitored.

Military base cleanups

Military sites that require cleanup due to hazardous waste contamination also fall under Superfund authority. Nine of Indiana's active or closing military bases and several other formerly used defense sites are being investigated or cleaned up. Each military site has many different areas that require cleanup.

The cleanup and reuse of military properties have created two new state parks, Charlestown and Fort Harrison, and a new state correctional facility at the former Grissom Air Force Base.

State cleanups

Indiana has identified an additional 62 contaminated hazardous waste sites around the state. These sites do not qualify as Superfund sites due to the level or nature of contamination, but still present environmental and public health risks. Of the 62 sites identified for potential action, five were cleaned up in 1999.

Hazardous waste cleanups

Contamination from spills or releases into the environment at currently operating facilities may pose significant environmental concerns. Hazardous waste management facilities are required to investigate areas suspected of being contaminated from past practices or events and perform cleanups, if necessary.

Indiana has approximately 305 hazardous waste facilities subject to investigation and appropriate cleanup; 103 are being addressed, of which 37 are considered high-priority sites.

Brownfields redevelopment

Brownfields are abandoned or underused industrial or commercial sites where development is complicated by actual or perceived environmental contamination. Prospective purchasers may be reluctant to purchase a brownfield property because of concerns about legal liability from potential contamination at the site.

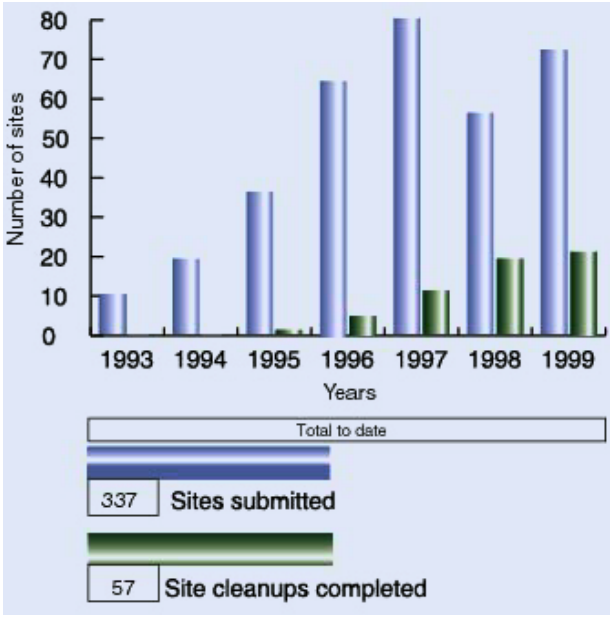
Redeveloping brownfields links economic vitality and jobs with environmental protection. During 1999, 64 Indiana communities identified 70 sites to be redeveloped and returned to productive economic reuse. Eighteen sites were identified to require some type of cleanup.

Voluntary remediation

Some property owners choose to clean up contamination discovered on their properties themselves, with state oversight. Properties that are cleaned up in this manner are referred to as voluntary remediation sites.

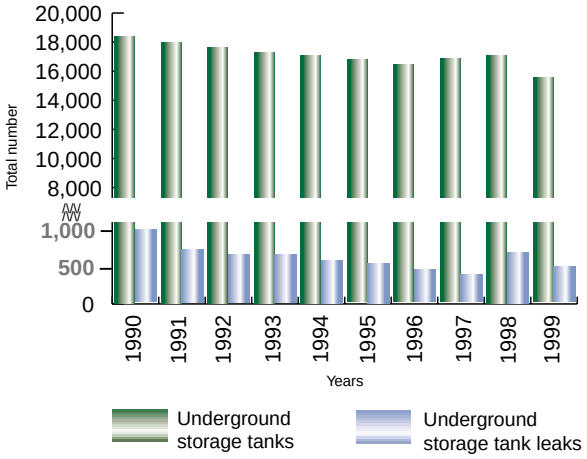
Since 1993, 337 applications have been received by the state, and 244 are currently active projects. To date, 57 sites have been cleaned up.

Voluntary remediation

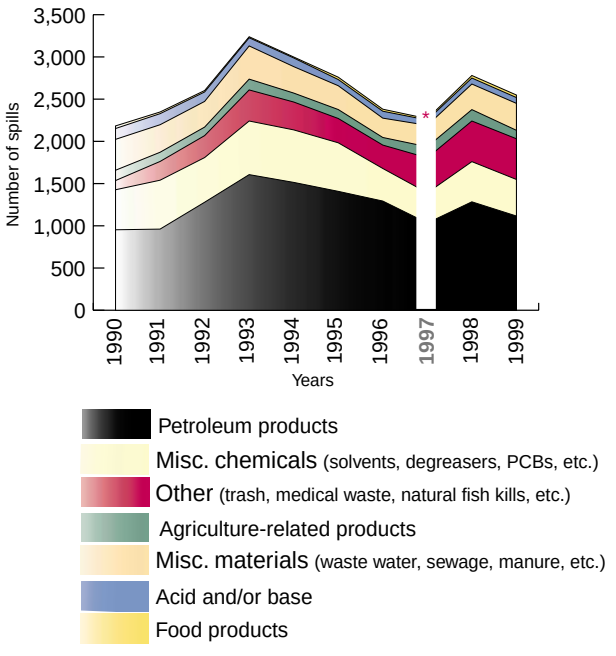


Graphs' Source: IDEM Office of Land Quality, 1999

Registered underground storage tanks



Spill reports



*A substantial revision to reporting rules was made in July 1997. This resulted in a change of reporting practices and totals. Therefore, 1997 data is not comparable to other years and is not shown.

Graphs source: IDEM Office of Land Quality, 1999

Underground storage tanks

Underground storage tanks at gas stations and other businesses are a common source of soil and ground water contamination. Contaminants such as petroleum products from leaking underground storage tanks threaten human health and the environment. Contaminants can reach drinking water wells or travel as vapors into sewers and basements, creating a fire and explosion danger and threatening human health and the environment. These sites are cleaned up by responsible parties or by IDEM.

Since 1990, more than 6,000 regulated underground storage tank leaks have been reported in Indiana. At the end of 1999, 41 percent of these tanks had been approved for clean up and closure. Approximately seven percent of all identified leaking tanks are considered significant threats to humans or the environment and are undergoing cleanup.

Nearly 94 percent of facilities with registered underground storage tanks inspected in 1999 were in full compliance with federal requirements for leak detection, spill and overfill prevention, and corrosion protection.

Emergency response

Chemical spills, agricultural related releases, fires, explosions and other disasters endanger human health and the environment. These threats can expose people to hazardous fumes or liquids and/or contaminate drinking water supplies. In 1999, more than 2,500 spills were reported, compared to more than 2,600 in 1998. Reported spills are categorized by priority, based on the amount spilled, the toxicity or other hazards posed by the substance and the location of the spill. In 1999, approximately 15 percent of all reported spills were categorized as Priority I, the highest priority ranking.

HAZARDOUS WASTE

Hazardous waste generation

Ignitable, corrosive, reactive or toxic hazardous wastes pose substantial threats to human health and the environment if they are not properly managed. In 1997, 626 Indiana facilities generated 7.3 million tons of hazardous waste. While this is an 11 percent increase from 1995, manufacturing activities increased 15 percent. More facilities were generating waste, and the economy was producing goods at near capacity.

Hazardous waste is generated in many forms, including hazardous waste created by our modern life-styles. Household hazardous waste collection facilities and annual collection days around Indiana allow citizens to bring their used oil, half empty paint cans, pesticides and other hazardous products to a central location for proper management.

Hazardous waste treatment and disposal

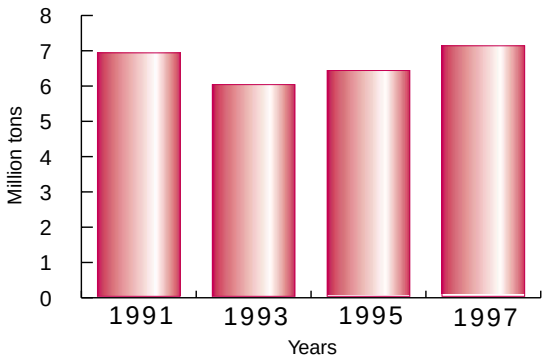
Most hazardous waste generated in Indiana is treated on site in treatment systems regulated by the Clean Water Act. During 1997, 95 percent of the hazardous waste generated was treated in this manner at the sites of generation. The remaining waste was sent off site to permitted hazardous waste treatment, storage or disposal facilities.

During 1997, permitted treatment, storage and disposal facilities in Indiana received approximately 605,000 tons of hazardous waste from both in-state and out-of-state sources. This waste was recovered and reused, incinerated, landfilled or otherwise treated.

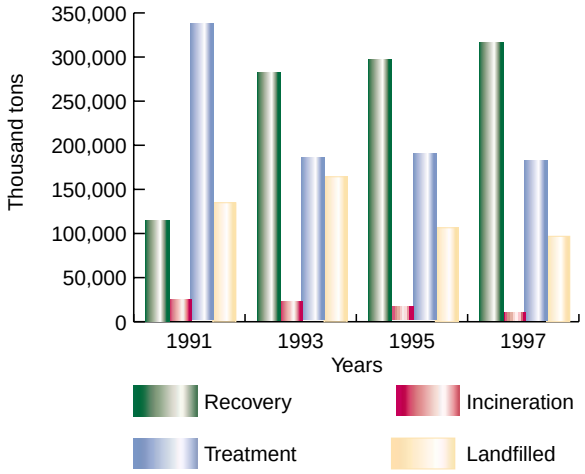
In 1997, Indiana shipped approximately 160,000 tons of hazardous waste to 26 states, 70,000 tons less than in 1995. Indiana treatment, storage and disposal facilities received approximately 260,000 tons of waste from 48 states, the same amount as in 1995.

The hazardous waste numbers are reported on a biennial basis, numbers for 1999 are not due in to IDEM until March 1, 2000. Therefore, the information in this section will be updated in the next year's report.

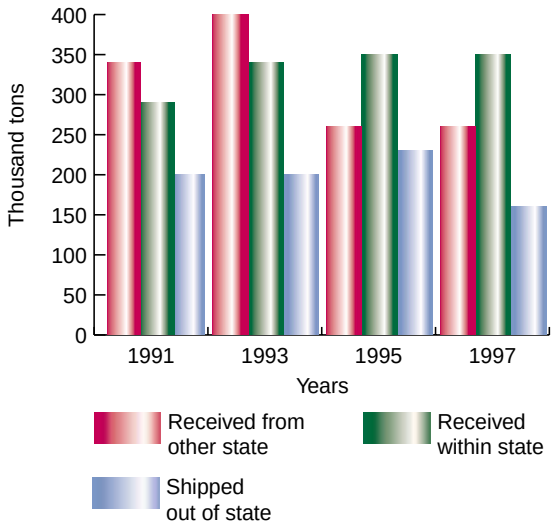
Hazardous waste generation



Hazardous waste management methods

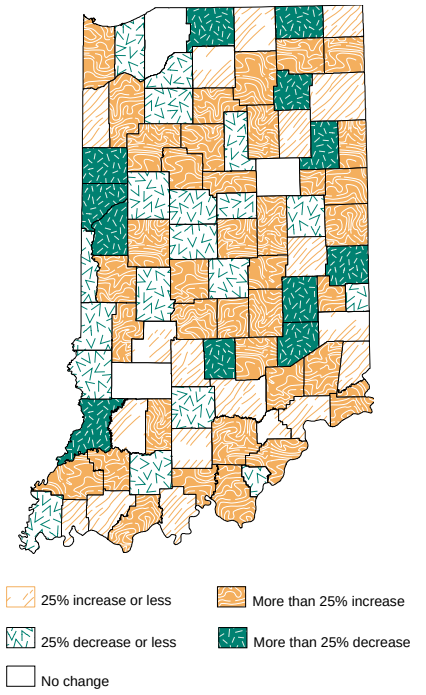


Shipments of hazardous waste



Graphs source: Resource Conservation and Recovery Act Biennial Hazardous Waste Report, 1991-1997

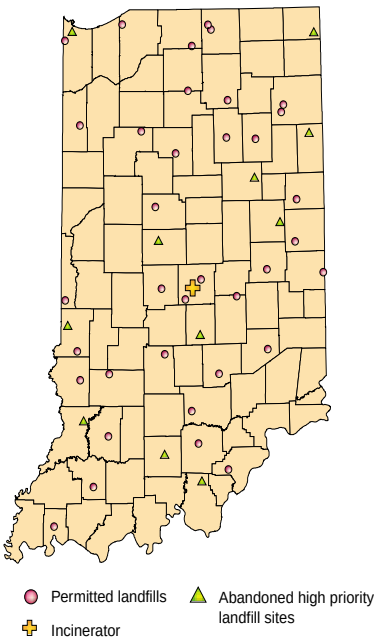
Disposal rates per county,* 1993-1999



* Based on information reported by Indiana landfills and transfer stations. Information from Ohio and Kentucky was also used. Information from Michigan and Illinois was not available.

Source: IDEM Office of Pollution Prevention and Technical Assistance and Office of Land Quality, 1999

Municipal solid waste disposal facilities



Maps source: IDEM Office of Land Quality, 1999

SOLID WASTE

Disposal

Waste that is not diverted from disposal goes to a permitted landfill or incinerator. Disposal rates for all permitted municipal solid waste landfills and transfer stations vary by county, as shown by the map. In 1999, Indiana had 37 operating municipal solid waste landfills, down from 72 in 1991.

An estimated 400 landfills and municipal dumps have been closed in Indiana. Many of these sites were closed before environmental protection laws were in place and, therefore, may pose a risk to ground and surface waters. In 1999, the Abandoned Landfill (ALF) group was formed to address environmental impacts from landfills that are not actively regulated under the conventional solid waste programs. The ALF group has identified 11 high priority sites to begin work on in 2000.

Source reduction and recycling

Indiana encourages source reduction and recycling, which includes purchasing more durable products for long-term use, finding new uses for old household materials and recycling to reduce waste. In, 1990, Indiana established voluntary goals to reduce waste disposal 35 percent by January 1996 and 50 percent by January 2001.

The source reduction and recycling rate for municipal solid waste increased 2 percentage points between 1996 and 1998 from 32 percent to 34 percent.

In 1999, three revisions were made to how the reduction in waste disposal is calculated. First, the base year for calculations is 1993 instead of 1991, as information reported is considered more accurate for 1993. Second, adjustments to waste generation are made each year based on changes in the Gross State Product, instead of total earnings and population changes. Third, all waste disposed in commercial landfills is taken into account instead of just household waste.

Solid waste landfills

In 1998, permitted operating solid waste landfills accounted for approximately five square miles of the state's land area. Although the number of landfills is decreasing, the average size of each is growing. At the end of 1998, Indiana's solid waste landfills had a combined capacity of approximately 127 million tons.[1] This is an increase of nearly 33 million tons from the 1995 total capacity. Depending on disposal rates, this landfill space is predicted to last until sometime in 2012.[2] However, it is expected that landfill expansions will continue to provide future capacity.

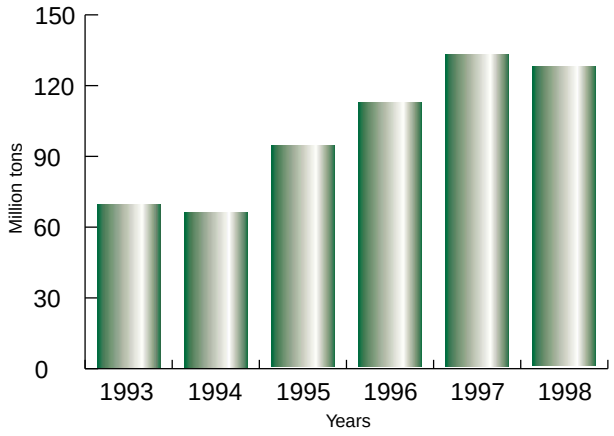
Waste imports affect the amount of landfill capacity available for Indiana residents and businesses. In 1998, out-of-state trash accounted for 27 percent of the waste disposed in Indiana's solid waste landfills. In contrast, in 1998 an estimated 10 percent of Indiana's solid waste was disposed out of state.

The design and construction of landfills over the years have improved significantly. New landfill areas are required to have composite liners made with a combination of compacted soil and plastic liners and systems to collect, treat and dispose of contaminated water from the landfill. These requirements help protect groundwater from landfill leaks. The amount of Indiana's waste landfilled over composite liners in 1998 was 84 percent, an increase of 36 percent since 1995.

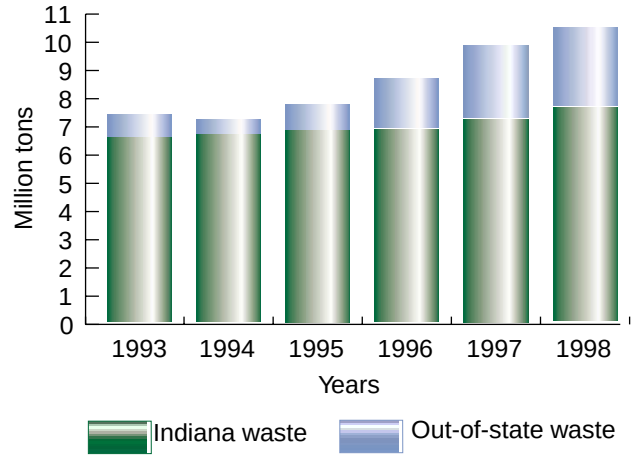
[1] Gross airspace measure—initial measure in volume, from subgrade to top of final cover. Volume was converted to weight using a factor of two cubic yards per ton. This factor averages compactor rates for all landfills and accounts for volume reductions due to liners, daily, and final cover.

[2] Based on the assumption that disposal rates will remain at 1998 levels.

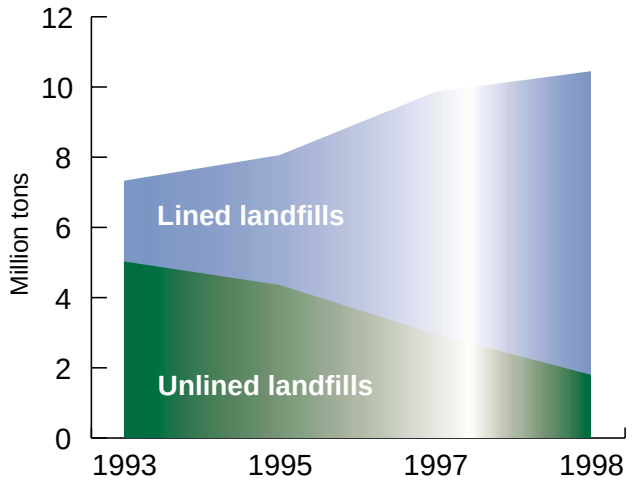
Solid waste landfill capacity



Solid waste disposal in Indiana

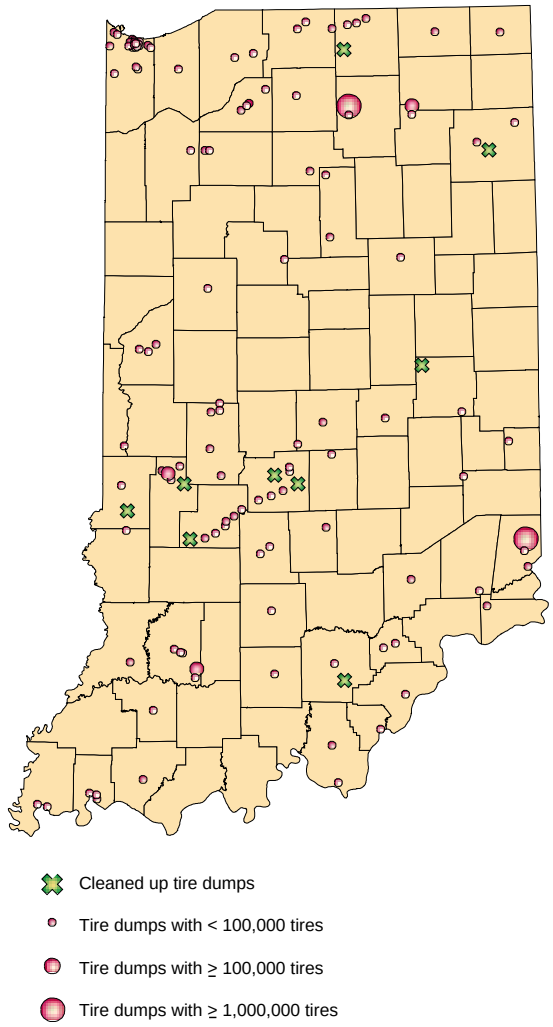


Solid waste landfill disposal methods

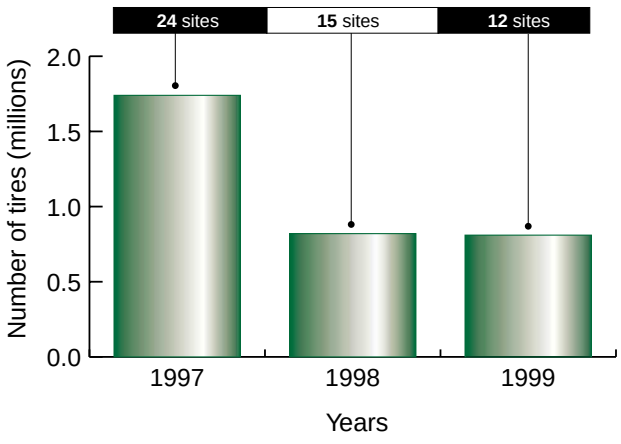


Graphs source: 1998 Indiana Solid Waste Facilities Annual Report

Waste tire dumps



Waste tire cleanup



Map and Graph Source: IDEM Office of Land Quality, 1999

TIRE DUMPS

On average, Indiana generates about one waste tire per person per year–approximately 5.5 million per year. From 1995 to 1999, more than 3.1 million tires were removed for proper disposal from illegal dumps containing an estimated total of 18.5 million waste tires.

IDEM has identified 164 illegal tire dumps in Indiana. Two of these sites, with about 25,000 total tires, were cleaned by landowners or responsible parties in 1999. Ten more sites, with an estimated 790,530 tires, were cleaned using state waste tire funds or as supplemental environmental projects. Cleanup of additional sites using state funds is planned for 2000.

Cleanup on the largest waste tire pile in Indiana began in February of 2000. An estimated 4.5 million waste tires from the Atwood G&M recycling site in Kosciusko County are planned to be removed and shredded. The cleanup is anticipated to be completed in the summer of 2001.

Problems with tire piles

Large waste tire piles are breeding grounds for disease-carrying mosquitos. If set on fire, large tire piles burn with intense heat, blowing thick, black hazardous smoke downwind. Tire fires are difficult to extinguish, sometimes burning for days.

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